Actisense®

NMEA Reader (v3.031) & EBL Reader (v1.090)

Full User Manual

Issue 1.00

- Receives and interprets NMEA 2000 messages via an NGT-1
- Receives and interprets NMEA 0183 sentences on any PC com port or a USB port (ideally via an isolated connection such as the USG-1)
- Configuration options for the NGT-1 and the NGW-1

Contents

Important Notices 5
Notices 5
Foreword 5
Introduction 5
Features 5
- NMEA Reader 5
- EBL Reader 5

Software Updates 5
Software Installation 5
Figure 1 - NMEA Reader - Main Window 6
NMEA Reader Main Window 7
- Menus 7
- Toolbar Icons 7
- Connection Window Controls 8
- Connection Window Indicators 8
- Status Bar Information 8

Connection Windows 8
- Received Data Window 8
- Data Breakdown Window 9
- NMEA 2000 9
- NMEA 0183 9

Hardware Config Window 10
- Rx and Tx PGN List Tabs 10
- Rx PGN List Window 10
- Figure 2 - Rx PGN List Tab 10
- Figure 3 - Tx PGN List Tab 10
- PGN List Layout 10
- Baud Rate Tab 11
- Figure 4 - Baud Rate Tab 11

Figure 5 - EBL Reader - Main Window 12
EBL Reader Main Window 13
- Menus 13
- Toolbar Icons 13
- Received Data Window 13
- Data 13
- Colour Coding 13
- Data Breakdown Window 13
- NMEA 2000 13
- NMEA 0183 14
- Actisense BEM 14

Product Order Codes 16
Company Information 16

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Foreword

At Active Research Limited, we recognise that instructions are often skipped, so we have aimed to write this document in an informative and direct manner that will aid the user. We have covered all the points a typical user needs to know.

Introduction

This manual covers the use of both NMEA Reader and EBL Reader and includes the configuration options available for the **NGT-1** and **NGW-1**.

This manual is structured based on where a feature is accessed. Any additional information about the use of each features is explained at the same time.

Compatible with all Actisense products that can be connected to a PC and provide NMEA 0183 sentences or NMEA 2000 messages.

Full information on the complete **Actisense** product range and a list of all Actisense 'NGT Certified Software' products can be found on the **Actisense website (www.actisense.com)**.

Features

NMEA Reader

- Receives and displays NMEA 2000 messages via an **NGT-1** that is connected to an active NMEA 2000 bus.
- Receives and displays NMEA 0183 sentences from any serial or virtual serial port connection.
- Provides detailed information on the currently selected message (field breakdown and description).
- View multiple connections simultaneously.
- Record log files of received data as EBL files for viewing with EBL Reader at a later date.
- Access configuration options for both the **NGT-1** and **NGW-1** devices.

EBL Reader

- Displays log files saved by NMEA Reader of time-stamped NMEA 0183 sentences or NMEA 2000 messages.
- Provides detailed information on currently selected message displayed (field breakdown).
- Displays text files of NMEA 0183 sentences.

Software Updates

The configuration options are directly linked to the Firmware within the **NGT-1** and the **NGW-1**. Both these devices are capable of being updated to include new features that may effect the way NMEA Reader needs to operate. It is strongly recommended that the very latest version of both the Firmware and NMEA Reader is used.

It is our policy to provide these updates free on the **Actisense website (www.actisense.com)**, so that the **Actisense** software and devices can become more sophisticated with time, and should there be any bugs reported, they can be promptly fixed.

Software Installation

Download and run the executable file from the **Actisense website (www.actisense.com)**.
A wizard will open and guide you through the installation process.
Once installed you have the option to run the program direct from the install wizard.
Alternatively simply run from either the Windows 'All Programs' menu shortcut or the desktop icon.

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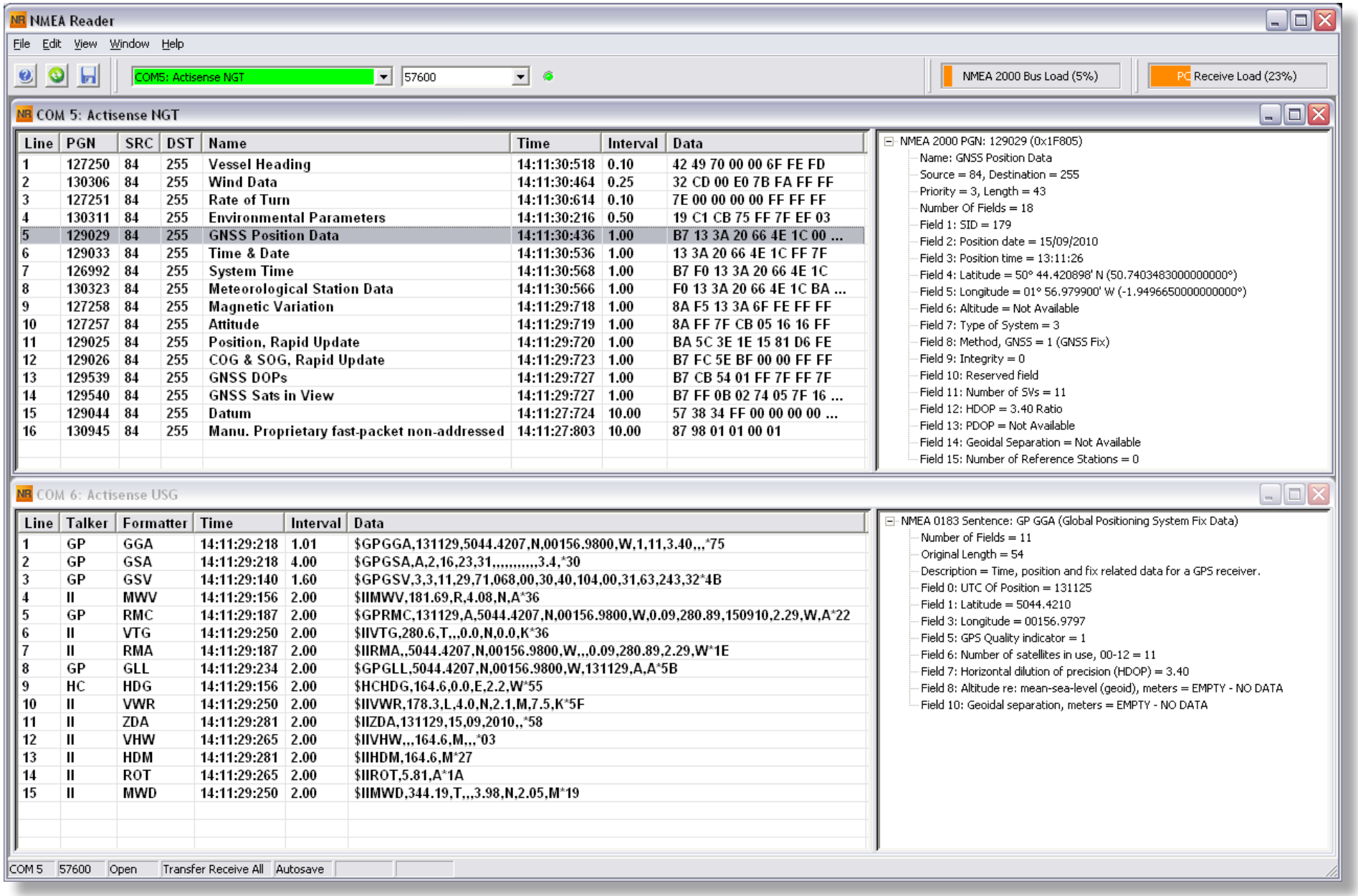
NMEA Reader
File Edit View Window Help
COM5: Actisense NGT
57600
NMEA 2000 Bus Load (5%)
PC Receive Load (23%)
COM 5: Actisense NGT
Line PGN SRC DST Name Time Interval Data
1 127250 84 255 Vessel Heading 14:11:30:518 0.10 42 49 70 00 00 6F FE FD
2 130306 84 255 Wind Data 14:11:30:464 0.25 32 CD 00 E0 7B FA FF FF
3 127251 84 255 Rate of Turn 14:11:30:614 0.10 7E 00 00 00 00 FF FF FF
4 130311 84 255 Environmental Parameters 14:11:30:216 0.50 19 C1 CB 75 FF 7F EF 03
5 129029 84 255 GNSS Position Data 14:11:30:436 1.00 B7 13 3A 20 66 4E 1C 00 ...
6 129033 84 255 Time & Date 14:11:30:536 1.00 13 3A 20 66 4E 1C FF 7F
7 126992 84 255 System Time 14:11:30:568 1.00 B7 F0 13 3A 20 66 4E 1C
8 130323 84 255 Meteorological Station Data 14:11:30:566 1.00 F0 13 3A 20 66 4E 1C BA ...
9 127258 84 255 Magnetic Variation 14:11:29:718 1.00 8A F5 13 3A 6F FE FF FF
10 127257 84 255 Attitude 14:11:29:719 1.00 8A FF 7F CB 05 16 16 FF
11 129025 84 255 Position, Rapid Update 14:11:29:720 1.00 BA 5C 3E 1E 15 81 D6 FE
12 129026 84 255 COG & SOG, Rapid Update 14:11:29:723 1.00 B7 FC 5E BF 00 00 FF FF
13 129539 84 255 GNSS DOPs 14:11:29:727 1.00 B7 CB 54 01 FF 7F FF 7F
14 129540 84 255 GNSS Sats in View 14:11:29:727 1.00 B7 FF 0B 02 74 05 7F 16 ...
15 129044 84 255 Datum 14:11:27:724 10.00 57 38 34 FF 00 00 00 00 ...
16 130945 84 255 Manu. Proprietary fast-packet non-addressed 14:11:27:803 10.00 87 98 01 01 00 01
NMEA 2000 PGN: 129029 (0x1F805)
Name: GNSS Position Data
Source = 84, Destination = 255
Priority = 3, Length = 43
Number Of Fields = 18
Field 1: SID = 179
Field 2: Position date = 15/09/2010
Field 3: Position time = 13:11:26
Field 4: Latitude = 50° 44.420898' N (50.7403483000000000°)
Field 5: Longitude = 01° 56.979900' W (-1.9496650000000000°)
Field 6: Altitude = Not Available
Field 7: Type of System = 3
Field 8: Method, GNSS = 1 (GNSS Fix)
Field 9: Integrity = 0
Field 10: Reserved field
Field 11: Number of SVs = 11
Field 12: HDOP = 3.40 Ratio
Field 13: PDOP = Not Available
Field 14: Geoidal Separation = Not Available
Field 15: Number of Reference Stations = 0
COM 6: Actisense USG
Line Talker Formatter Time Interval Data
1 GP GGA 14:11:29:218 1.01 $GPGGA,131129,5044.4207,N,00156.9800,W,1,11,3.40,,,*75
2 GP GSA 14:11:29:218 4.00 $GPGSA,A,2,16,23,31,,,,,,,,,,,,3.4,*30
3 GP GSV 14:11:29:140 1.60 $GPGSV,3,3,11,29,71,068,00,30,40,104,00,31,63,243,32*4B
4 II MWV 14:11:29:156 2.00 $IIMWV,181.69,R,4.08,N,A*36
5 GP RMC 14:11:29:187 2.00 $GPRMC,131129,A,5044.4207,N,00156.9800,W,0.09,280.89,150910,2.29,W,A*22
6 II VTG 14:11:29:250 2.00 $IIVTG,280.6,T,,,0.0,N,0.0,K*36
7 II RMA 14:11:29:187 2.00 $IIRMA,,5044.4207,N,00156.9800,W,,,0.09,280.89,2.29,W*1E
8 GP GLL 14:11:29:234 2.00 $GPGLL,5044.4207,N,00156.9800,W,131129,A,A*5B
9 HC HDG 14:11:29:156 2.00 $HCHDG,164.6,0.0,E,2.2,W*55
10 II VWR 14:11:29:250 2.00 $IIVWR,178.3,L,4.0,N,2.1,M,7.5,K*5F
11 II ZDA 14:11:29:281 2.00 $IIZDA,131129,15,09,2010,,*58
12 II VHW 14:11:29:265 2.00 $IIVHW,,,164.6,M,,,*03
13 II HDM 14:11:29:281 2.00 $IIHDM,164.6,M*27
14 II ROT 14:11:29:265 2.00 $IIROT,5.81,A*1A
15 II MWD 14:11:29:250 2.00 $IIMWD,344.19,T,,,3.98,N,2.05,M*19
NMEA 0183 Sentence: GP GGA (Global Positioning System Fix Data)
Number of Fields = 11
Original Length = 54
Description = Time, position and fix related data for a GPS receiver.
Field 0: UTC Of Position = 131125
Field 1: Latitude = 5044.4210
Field 3: Longitude = 00156.9797
Field 5: GPS Quality indicator = 1
Field 6: Number of satellites in use, 00-12 = 11
Field 7: Horizontal dilution of precision (HDOP) = 3.40
Field 8: Altitude re: mean-sea-level (geoid), meters = EMPTY - NO DATA
Field 10: Geoidal separation, meters = EMPTY - NO DATA
COM 5 57600 Open Transfer Receive All Autosave

Figure 1 - NMEA Reader - Main Window

NMEA Reader Main Window

The main window has a standard Windows pull-down menu at the top. Below this is a Toolbar that has action icons, port connection controls and load indicators. There is a main display area below the Toolbar and at the bottom of the window there is a Status Bar.

The main area of the window is where data from connected NMEA sources can be displayed. Multiple connections can be viewed simultaneously and appear as windows in this area.

Menus

File → New Connection

Opens a new connection window to display messages from a selected NMEA source. Multiple windows can be opened to allow messages from more than one port to be viewed at a time.

File → Exit

Closes NMEA Reader.

Edit → Preferences

Transfer: Receive All
Only available when connected using an NGT-1. Allows all messages to be transferred from the NMEA 2000 bus to the PC for displaying in the connection window.

Note: The NGT-1 will remain in 'Transfer Receive All' mode until the user selects 'Transfer Normal' or the unit has a power reset. This allows the NGT-1 to be used in 'Transfer Receive All' mode after NMEA Reader is closed.

Transfer: Normal
Only available when connected using an NGT-1. Only messages in the NGT-1's Rx PGN list to will be transferred from the NMEA 2000 bus to the PC for displaying in the connection window.

Choose Log Directory
Change the location that all log files are saved to from the default location of 'My Documents'. A standard Windows directory browser will open to allow the selection of the new save location.

Auto Save Changes
When ticked: User settings will be remembered for the next time NMEA Reader is opened.
When not ticked: Default settings will be used each time NMEA Reader is run.
Settings Remembered are:
- View settings (column widths etc.)
- Open connection settings (port number and Baud rate)
- Log file save directory
- Transfer mode (for NGT-1 connections only)

Hardware Config
Opens the configuration options dialogue window. See **"Hardware Config Window" on page 10**.

View → Toolbar

Show or hide the toolbar of icons.

View → Status Bar

Show or hide the status bar at the bottom of the main window.

Window → Cascade

All open connection windows will be arranged in a cascade. The currently selected (in focus) window will be displayed at the front.

Window → Tile Horizontally

All open connection windows will be tiled in full width windows. The currently selected (in focus) window will be displayed at the top.

Window → Tile Vertically

All open connection windows will be tiled in full height windows. The currently selected (in focus) window will be displayed on the left.

Window → ('Active Connections')

Listed beneath the separation bar are all the open connection windows. Selecting a connection will make it active and come to the front if hidden.

Help → About NMEA Reader

Shows the 'about' dialogue box, which includes the software version number.

Toolbar Icons

About

Click this icon to display the 'About' dialogue box, which includes the software version number.

Refresh

Clicking this icon clears any messages/sentences present in the active connection window.

Save Log File

Clicking this icon will toggle the logging, on and off, for the active connection. Log files are saved to 'My Documents' unless the log directory has been changed via the edit preferences menu. Log files can be viewed using EBL Reader and contain additional information not shown in NMEA Reader, including unknown and system messages. Logs allow the viewing of messages/sentences in chronological order.

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Connection Window Controls

Port Selection Menu

Select the COM port to open for the active connection from the drop down menu. All available com ports will be displayed.

Baud Rate Selection Menu

Select the required Baud rate for the active connection from the drop down menu.

NGT-1 Connection Indicator LED

This LED shows whether an NGT-1 is operating on the active connection. This is useful when there is no data to displayed.

Connection Window Indicators

PC Receive Load Indicator

The right hand indicator shows the PC receive loading of the active connection. Shown as a percentage of used bandwidth for the Baud rate selected in the 'Baud Rate Selection Menu'.

NMEA 2000 Bus Load Indicator

The left hand indicator shows the loading on the NMEA 2000 bus. This indicator is only visible when the active connection is an NGT-1 in 'Transfer All' mode.

Status Bar Information

Com Port Number

Shows the COM port number of the active connection.

Baud Rate Value

Shows the Baud rate of the active connection.

Com Port Status

Shows the status of the active connections COM port. Open or Closed.

Transfer Mode State

Shows which mode the device is in.

- NGT-1: 'Transfer Normal' or 'Transfer Receive All'.
- NGW-1: 'Translate Normal'.
- Other Devices: This section will be blank.

Autosave Mode Indicator

When in 'Autosave' mode this is shown in the status bar.

Connection Windows

Each connection window consists of two parts. The left hand window shows the messages as they arrive on the port and the right hand window shows a break down of the highlighted message.

Received Data Window

Line

The row number of the displayed message/sentence.

PGN

Seen with NMEA 2000 messages only. The PGN number of the received message.

SRC

Seen with NMEA 2000 messages only. The source address the message was sent from.

DST

Seen with NMEA 2000 messages only. The destination address the message was sent to. When a message is sent to all devices the message will contain the global address value of 255. The NGT-1 will receive all messages on the NMEA 2000 bus, regardless of the destination address, for displaying with NMEA Reader.

Name

Seen with NMEA 2000 messages only. The descriptive name of the message received.

Talker

Seen with NMEA 0183 sentences only. The identifier of the source device.

Formatter

Seen with NMEA 0183 sentences only. The identifier of the sentence received.

Time

The time the last message/sentence was received.

Interval / Freq (Hz)

When set to 'Interval' the average length of time, in seconds, between messages is displayed. When set to 'Freq. (Hz)' the frequency of the messages is displayed in Hertz. To switch between the two display options, right click anywhere in the interval/frequency column and select the option required from the pop-up list.

Data

Shows the actual data contained within the message/ sentence.

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Data Breakdown Window

When a message is selected/highlighted in the received data window the data breakdown window will provide in-depth information about the message.

NMEA 2000

Heading Line
The first line confirms the message is NMEA 2000 and shows the value of the PGN in decimal and hexadecimal. The '+' symbol allows the information to be expanded or collapsed.

Name
The name of the message received.

Source & Destination
The source address the message was sent from followed by the destination address the message was sent to. When a message is sent to all devices the message will contain the global address value of 255. The NGT-1 will receive all messages on the NMEA 2000 bus, regardless of the destination address, for displaying with NMEA Reader.

Priority and Length
The priority the message was assigned, from 1 to 9, 1 being the highest priority. This is followed by the length of the data contained in the message.

Number Of Fields
The number of separate fields contained in the data section of the message.

Fields
Each field is displayed separately with its field number, the type of data and the value of the data in that field.

NMEA 0183

Heading Line
The first line confirms the data is NMEA 0183 and shows the Talker ID and Formatter ID along with the name of the sentence. The '+' symbol allows the information to be expanded or collapsed.

Number of Fields
The number of separate fields contained in the data section of the sentence.

Original Length
The number of characters contained in the sentence, includes the start character and the checksum value.

Description
A description of what information the sentence contains.

Fields
Each field is typically displayed separately with its field number, the type of data and the value of the data in that field. Some fields are merged for example, with MWD, field 0 shows the direction value and includes the 'units' from field 1 which is 'True'. Combining the value and unit fields makes it easier to understand.

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Hardware Config Window

The 'Hardware Config' window comprises of several tabs each with a configuration option (if available) for the connected device. All tabs will use the same standard action buttons seen at the bottom of the window.

OK
When clicked all modified settings, including those from inactive tabs, will be downloaded to the device. On completion the window will close.

Cancel
When clicked the window will close, discarding any modified settings.

Apply
When clicked all modified settings, including those from inactive tabs, will be downloaded to the device. The window will remain open for further editing.

Note: Clicking 'OK' or 'Apply' downloads the new settings to the device. These settings will be used for all future communications or until new settings are downloaded.

Rx and Tx PGN List Tabs

The NGT-1 and NGW-1 store lists of PGN's that are allowed to be received from or transmitted to the NMEA 2000 bus.

Rx PGN List Window

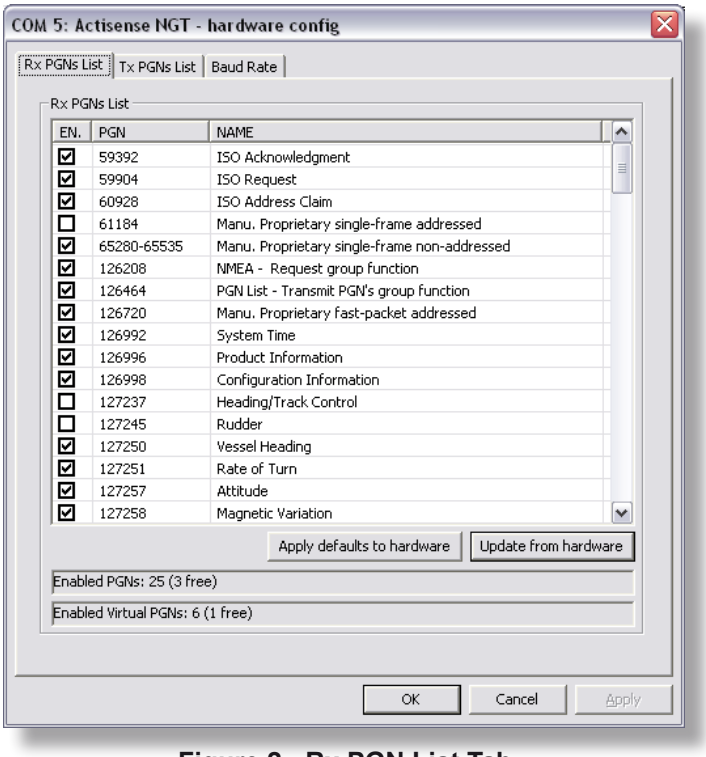

Figure 2 - Rx PGN List Tab

The Rx list refers to the PGN's that are received from the NMEA 2000 bus.

Note: When in 'Transfer: Receive All' mode you will still see all the messages in the main connection window. Switch to 'Transfer: Normal' mode to see the list working.

Tx PGN List Window

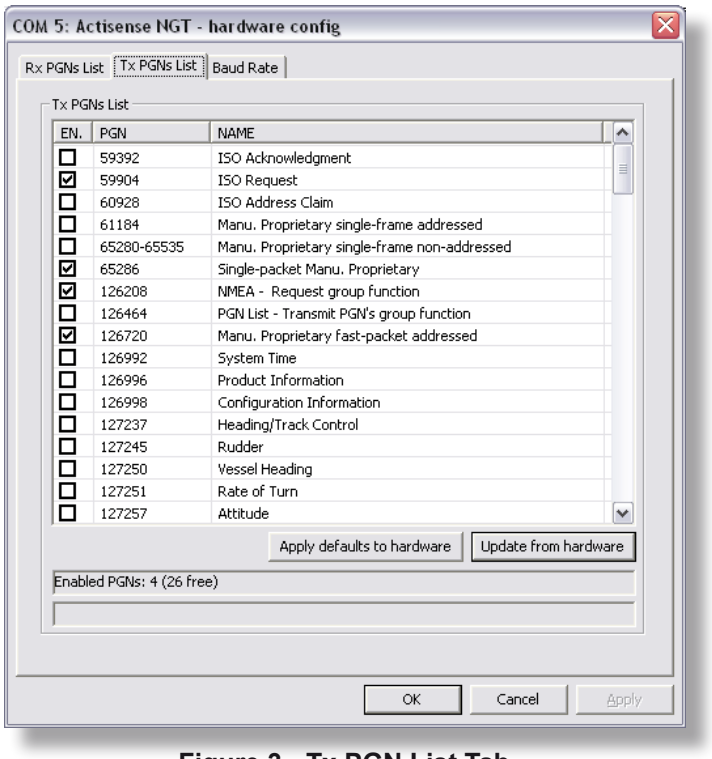

Figure 3 - Tx PGN List Tab

The Tx list refers to the PGN's that are to be transmitted onto the NMEA 2000 bus.

PGN List Layout

Each list comprises of three sortable columns, click the heading to sort.

En.
Tick boxes that show if the PGN is enabled or disabled.

PGN
The PGN that can be enabled or disabled.

Name
The name of the PGN message that can be enabled or disabled.

Apply Defaults to Hardware
Clicking this button will update the settings inside the device to the factory defaults. The displayed list is then updated to match upon completion.

Update from Hardware
Retrieves and displays the list stored in the connected device.

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Enabled PGN Status
Shows the number of PGN's that are enabled in the list, including the number that are allowed to be added. Any PGN that is not enabled will be prevented from being received from or transmitted to the NMEA 2000 bus.

Enabled Virtual PGN Status
This will only be seen on the Rx list and is only applicable to the NGT-1 (although the status will still be displayed for NGW-1's).

There are seven PGN's that are required by the NGT-1/ NGW-1 in order to operate correctly on the bus. These PGN's cannot be disabled from being received. The enable/disable option determines if the PGN is copied back to the PC or not. Enabling/disabling these PGN's will effect whether they are transferred to the PC or not.

Baud Rate Tab

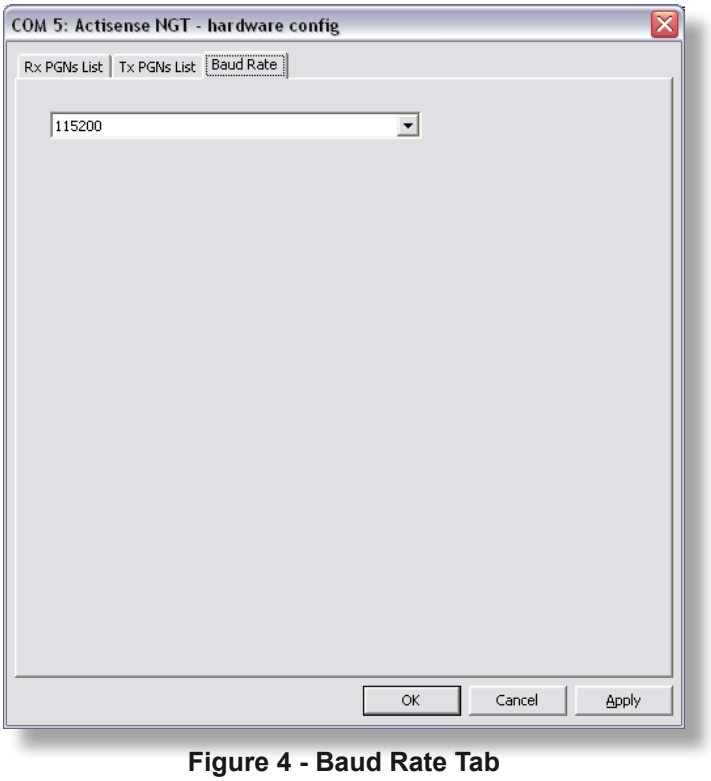

Figure 4 - Baud Rate Tab

Select the required Baud rate from the drop down menu and click OK or Apply. The baud rate of the device will be changed and the connection with the PC will be re-opened at the new rate.

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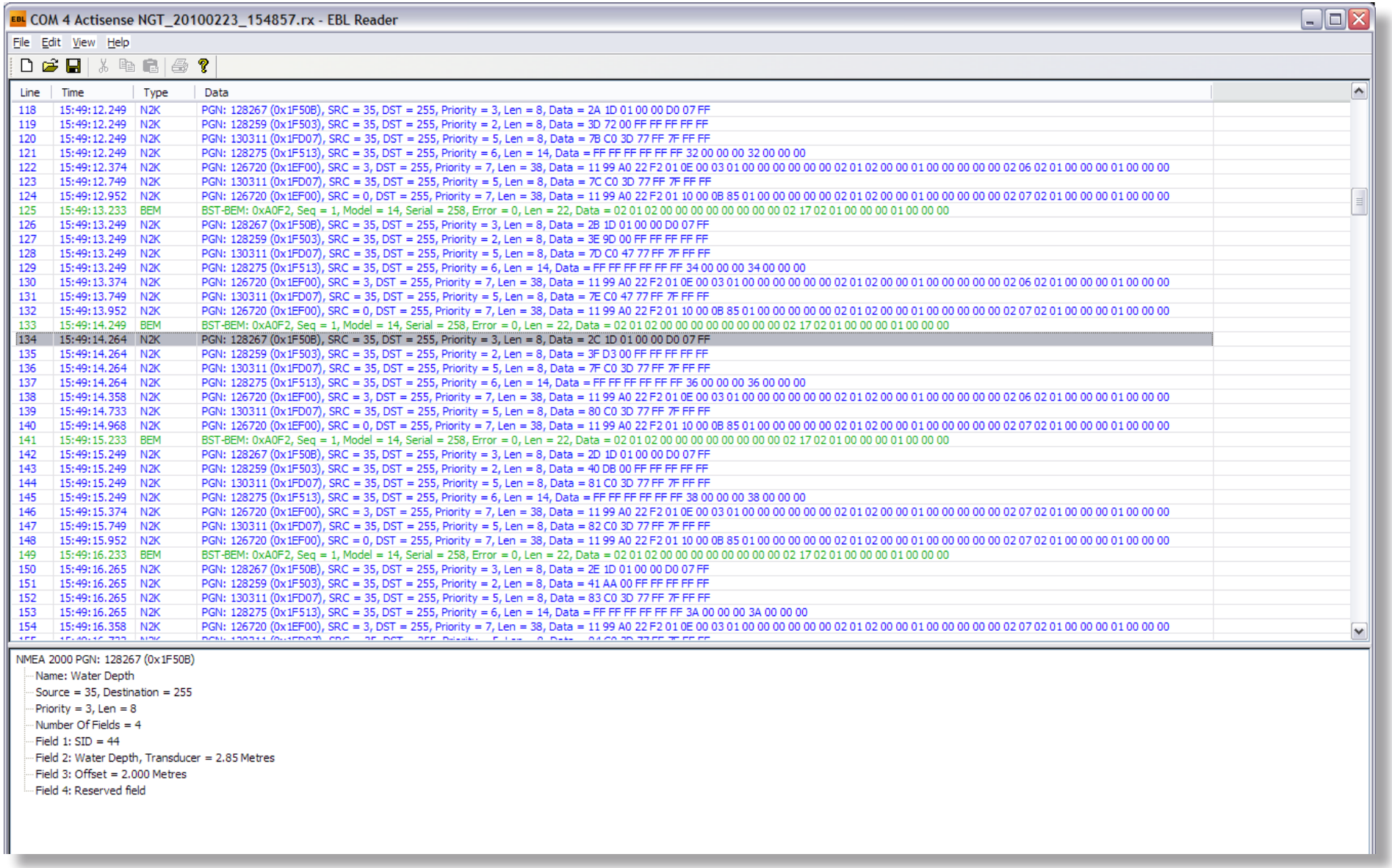

Figure 5 - EBL Reader - Main Window

EBL Reader Main Window

Menus

File → New

This option is currently disabled.

File → Open...

Open a log file to view, A standard windows directory browser will open to allow the selection of the file to open.

File → Save

This option is currently disabled.

File → Save As...

This option is currently disabled.

File→ Recent Files List

A list of recently opened files will be displayed. Click one to open it.

File → Exit

Closes EBL Reader.

Edit

All edit options are currently disabled.

View → Toolbar

Show or hide the tool bar of icons.

View → Status Bar

Show or hide the status bar at the bottom of the main window.

Help → About EBL Reader

Shows the 'about' dialogue box, which includes the software version number.

Toolbar Icons

New, Save, Cut, Copy, Paste and Print

These options are currently disabled.

Open

Open a log file to view. A standard windows directory browser will open to allow the selection of the file to open.

About

Click this icon to display the 'about' dialogue box.

Received Data Window

Line

The row number of the displayed message. This is the order in which the messages arrived.

Time

The time the message was received. This is the time local to the PC that created the log file.

Type

Shows if the data is NMEA 0183, NMEA 2000, BEM or Unknown. BEM messages are command messages used by Actisense for controlling the NGT-1 and NGW-1 and are separate from any NMEA data.

Data

Shows the actual data received in its message format.

Colour Coding

Purple is for NMEA 0183 sentences.
Blue is for NMEA 2000 messages.
Green is for Actisense BEM system messages.
Red is for unknown data.

Data Breakdown Window

The '+' symbol allows the information to be expanded or collapsed within this window.

NMEA 2000

Heading Line

The first line confirms the message is NMEA 2000 and shows the value of the PGN in decimal and hexadecimal.

Name

The name of the message received.

Source & Destination

The source address the message was sent from followed by the destination address the message was sent to. When a message is sent to all devices the message will contain the global address value of 255. The NGT-1 will receive all messages on the NMEA 2000 bus, regardless of the destination address, for displaying with NMEA Reader.

Priority and Length

The priority the message was assigned, from 1 to 9, 1 being the highest priority. This is followed by the length of the data contained in the message.

Number Of Fields

The number of separate fields contained in the data section of the message.

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Fields
Each field is displayed separately with its field number, the type of data and the value of the data in that field.

NMEA 0183

Heading Line
The first line confirms the data is NMEA 0183 and shows the Talker ID and Formatter ID along with the name of the sentence.

Number of Fields
The number of separate fields contained in the data section of the sentence.

Original Length
The number of characters contained in the sentence, includes the start character and the checksum value.

Description
A description of what information the sentence contains.

Fields
Each field is typically displayed separately with its field number, the type of data and the value of the data in that field. Some fields are merged for example, with MWD, field 0 shows the direction value and includes the 'units' from field 1 which is 'True'. Combining the value and unit fields makes it easier to understand.

Actisense BEM

These messages are used by Actisense products for configuration and communication between devices hardware. This information is only really useful to Active Research Ltd and is included for use when contacting customer support as a debugging aid.

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Product Order Codes

All products listed are configurable with NMEA Reader.
Other Actisense products and NMEA 0183 devices with PC connectivity are all compatible for displaying data.

NGT-1-ISO	**NMEA 2000 ↔ Serial PC Interface with ISO-Drive**
NGT-1-USB	**NMEA 2000 ↔ USB PC Interface**
NGW-1-ISO	**NMEA 2000 ↔ Serial NMEA 0183 Interface with ISO-Drive**
NGW-1-USB	**NMEA 2000 ↔ USB NMEA 0183 Interface**

Company Information

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